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Assistant Director for Research and Reports 25 September 1956

THRU : Chief, Economic Research
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One-Week Course in Titanium Metallurgy, New York University, College of Engineering and The Offices of Special Services to Business and Industry, 10 through 14 September 1956.

A. Purpose of Trip

To obtain up-to-date, firsthand information on the titanium industry, including raw materials, production, fabrication, and uses. Such information is essential in evaluating the potential of the Sino-Soviet Bloc for producing and utilizing this increasingly important structural metal.

B. Description

1. The course was a continuation of the one initiated a year ago. There were five or six lectures daily during the five-day seminar, each paper being followed by a question and answer period. The papers covered all phases of the titanium industry, and they were authored by acknowledged experts in their special fields. Over 200 titanium industrialists, engineers, and scientists were in attendance. These specialists participated not only in the discussion periods after the papers were read, but also in informal discussions in the evening.

2. An inspection trip through the titanium research laboratories of the University was another feature of the seminar.

3. A mimeographed copy of each lecture was supplied to registrants. One complete set is now on file in M/MP. These reports are valuable both for over-all information on the titanium industry and for specific information on technology of the industry.

C. Significant Developments Stressed During the Course

The material presented to the seminar indicated that:

1. Production of high-quality titanium sponge -- the pure metal required for the production of ingot and billets for fabrication -- was now no problem, either by the widely-used Kroll magnesium-reduction process or the newer sodium-reduction process.

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2. Electrolytic reduction, especially refining processes in which some spray metal may be removed, while much further advanced than a year ago, is still far from application on an industrial scale.

3. The problems involved in melting sponge into commercial grade ingot have been overcome for all practical purposes.

4. Methods for the production of high-strength titanium-base alloys have been improved greatly during the last year. Many of these alloys are now not only available but also guaranteed by the producers to meet consumers' chemical and physical specifications.

5. Some difficulties still persist in the production of semi-fabricated forms such as rolled sheet and plate, forgings, and extrusions of uniform quality. Particular problems also concern both the casting and finishing grinding of titanium. These difficulties, however, are being overcome rapidly by a vast world-wide program of research and development. In the US, the government has subsidized a substantial portion of the cost of such work during the last 18 months. The results of the western world's research and developments have had wide distribution even behind the Iron Curtain. All of the papers, for example, presented at this seminar were immediately available to the USSR through a Soviet scientist (S. A. Samarin) who was in attendance throughout the session.

6. The acceptance of the metal in aircraft production, as indicated by papers and discussions offered in the course, has become much more general than a year ago due to great improvements in the uniformity of semi-fabricated titanium products. This development has occurred despite the difficulties which still remain to be solved in connection with the production of uniform semi-fabricated products.

D. Conclusions and Recommendations

1. The conduct of the seminar was greatly improved over last year's performance. Most of the papers presented were of high caliber. Discussions by industry representatives were unusually forthright and revealing.

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2. The course succeeded very well in its purpose of presenting a well-rounded picture of the current status of the titanium industry.

3. It is recommended that CIA continue to send at least one qualified representative to all future titanium seminars sponsored by the New York University.

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